

# Contents

## Letters to the Editor

- An astrometric grid for the centre of the Galaxy  
*Fabrizius C., Jørgensen H.E.* L1
- Alignment of radio and X-ray sources across PG 1211+143  
*Arp H.* L5
- CO<sup>+</sup> in the Orion Bar, M 17 and S 140 star-forming regions  
*Störzer H., Stutzki J., Sternberg A.* L9
- The bulge and the warp of NGC 7814: stars, gas and dust  
*Lequeux J., Dantel-Fort M., Fort B.* L13
- Particle acceleration in extragalactic jets by intense long-wavelength electromagnetic fields  
*Bisnovatyi-Kogan G.S., Lovelace R.V.E.* L17
- Erratum (Letter): The extremely iron-deficient "post-AGB" stars are binaries  
*Van Winckel H., Waelkens C., Waters L.B.F.M.* 574
- ROSAT X-ray observations of the stellar clusters in NGC 2023 and NGC 2024  
*Freyberg M.J., Schmitt J.H.M.M.* L21
- First results of the CORONAS-DIFOS experiment. Space observations of solar irradiance oscillations  
*Lebedev N.I., Oraevsky V.N., Zhugzhda Y.D., Kopaev I.M., Kostyk R.I., Pflug K., Rüdiger G., Staude J., Bettac H.-D.* L25
- Effective collision strengths for transitions in the 4p<sup>3</sup> ground configuration of Kr IV  
*Schöning T., Butler K.* L29
- The black-hole candidate GRO J0422+32: MeV emission measured with COMPTEL  
*van Dijk R., Bennett K., Collmar W., Diehl R., Hermesen W., Lichti G.G., McConnell M., Ryan J., Schönfelder V., Strong A., van Paradijs J., Winkler C.* L33
- The weakness of diffuse bands in nebular environments. Possible impact on the PAH<sup>+</sup> hypothesis  
*Snow T.P., Bakes E.L.O., Buss Jr. R.H., Seab C.G.* L37
- Gravitational lensing origin for a possible gamma-ray burst repeater?  
*Hanlon L.O., Hermesen W., Kippen R.M., Matz S.M., O'Flaherty K.S., Preece R.D., Ryan J., Schönfelder V., Williams O.R., Winkler C.* L41
- The optical 'bullets' of SS 433 as a radiative instability phenomenon  
*Brown J.C., Mundell C.G., Petkaki P., Jenkins G.* L45

- Optically luminous QSOs observed with ROSAT  
*Reimers D., Bade N., Schartel N., Hagen H.-J., Engels D., Toussaint F.* L49

## Cosmology

- The contribution of AGNs to the X-ray background  
*Comastri A., Setti G., Zamorani G., Hasinger G.* 1
- Search for gravitational wave trains with the spacecraft ULYSSES  
*Bertotti B., Ambrosini R., Armstrong J.W., Asmar S.W., Comoretto G., Giampieri G., Iess L., Koyama Y., Messeri A., Vecchio A., Wahlquist H.D.* 13
- On the preferred length scale in the anisotropy field of extragalactic IRAS sources  
*Fabbri R., Natale V.* 289
- Distortions of the cosmic blackbody spectrum due to luminescence of H<sub>2</sub>D<sup>+</sup> molecules  
*Dubrovich V.K., Lipovka A.A.* 301
- Radio absorption by HeH<sup>+</sup> molecules in the spectra of remote QSOs  
*Dubrovich V.K., Lipovka A.A.* 307
- Perturbative Lagrangian approach to gravitational instability  
*Bouchet F.R., Colombi S., Hivon E., Juszkiewicz R.* 575
- BIMA observations of possible microwave background sources  
*Chernin L.M., Scott D.* 609
- Evolution of the supercluster-void network  
*Frisch P., Einasto J., Einasto M., Freudling W., Fricke K.J., Gramann M., Saar V., Toomet O.* 611

## Extragalactic astronomy

- Determining the bivariate brightness distribution of galaxies  
*Boyce P.J., Philipps S.* 26
- The molecular front in galaxies. I. CO vs H I in position-velocity diagrams  
*Sofue Y., Honma M., Arimoto N.* 33
- Determination of the pattern speed in the grand design spiral galaxy NGC 4321  
*Sempere M.J., García-Burillo S., Combes F., Knapen J.H.* 45

Extragalactic database. VI. Inclination corrections for spiral galaxies and disk opaqueness in the B-band

Bottinelli L., Gouguenheim L., Paturol G., Teerikorpi P.

64

Synthetic metal line indices for elliptical galaxies from super metal-rich  $\alpha$ -enhanced stellar models

Weiss A., Peletier R.F., Matteucci F.

73

Monitoring of active galactic nuclei. VI. The quasar Mkn 876

Erkens U., Wagner S.J., Alloin D., Axon D., de Bruyn A.G., Clavel J., Goad M.R., Gondhalekar P., van Groningen E., Jackson N., Kollatschny W., Laurikainen E., Lawrence A., Masegosa J., O'Brien P., Penston M.V., Pérez E., Pérez-Fournon I., Robinson A., Rodríguez-Espinoza J.M., Stirpe G.M., Tadhunter C., Terlevich R., Unger S.

90

Self-regulated star-formation in chemodynamical models of galaxies

Köppen J., Theis C., Hensler G.

99

The starburst galaxy PG 1136+581 = Mkn 1450 misclassified as a cataclysmic variable

Munari U., Zwitter T., Mikuž H.

310

The Hubble type of the double lobe radio galaxy NGC 5972

Véron P., Véron-Cetty M.-P.

315

Major axis kinematics of 15 early-type galaxies in the Fornax cluster

D'Onofrio M., Zaggia S.R., Longo G., Caon N., Capaccioli M.

319

Evolution of the broad-line region in NGC 5548

Wanders I.

332

HST observations of 3C 305

Jackson N., Sparks W.B., Miley G.K., Macchetto F.

339

Chemically consistent evolution of galaxies: broad band colours and Mg<sub>2</sub>

Einsel C., Fritze-v. Alvensleben U., Krüger H., Fricke K.J.

347

Dynamics of the Abell 98 cluster and the radio structure of 4C+20.04

Kremppeč-Krygier J., Krygier B.

359

Radio and optical evolution of the Seyfert galaxy NGC 1275

Nesterov N.S., Lyuty V.M., Valtaoja E.

628

The globular cluster system of NGC 5813

Hopp U., Wagner S.J., Richter T.

633

A search for low surface brightness dwarf galaxies in the Coma cluster core

Karachentsev I.D., Karachentseva V.E., Richter G.M., Vennik J.A.

643

X-ray emission of Seyfert 1 galaxies: the origin of the positive correlation between flux and spectral index

Torricelli-Ciamponi G., Courvoisier T.J.-L.

651

Detection of near-infrared emission from the eastern lobe of M 87

Neumann M., Meisenheimer K., Röser H.-J., Stickel M.

662

A survey for medium redshift ( $2.2 \leq z < 3.0$ ) optically variable QSOs

Véron P., Hawkins M.R.S.

665

## Galactic structure and dynamics

The distances to the Galactic Plane of old neutron stars

Hartman J.W., Verbunt F.

110

The stellar coronal component of the Galaxy. II. An analysis of the stellar content of the *Einstein* Extended Medium Sensitivity Survey

Sciortino S., Favata F., Micela G.

370

A method for solving the linearized Boltzmann equation for almost uniformly rotating stellar disks

Vauterin P., Dejonghe H.

380

## Stellar clusters and associations

Two reddened globular clusters projected close to the Galactic center: Palomar 6 and Djorgovski 1

Ortolani S., Bica E., Barbay B.

680

## Formation, structure and evolution of stars

(RN) Mass-radius relations for low-mass white dwarfs with helium and carbon interiors

Vennes S., Fontaine G., Brassard P.

117

Photometry of EP Lyrae and period changes in RV Tauri stars

Zsoldos E.

122

Turbulent plumes in stellar convective envelopes

Rieutord M., Zahn J.-P.

127

$\gamma$  Circinus: a young visual binary with pre-main-sequence component(s)?

Carette E., De Greve J.P., van Rensbergen W., Lampens P.

139

Hadronic phase transitions at supranuclear densities and the delayed collapse of newly formed neutron stars

Keil W., Janka H.-T.

145

Accretion stream mapping in eclipsing polars. An application of MEM and genetic optimisation

Hakala P.J.

164

High-precision timing observations of the millisecond pulsar PSR 1937+21 at Nançay

Cognard I., Bourgois G., Lestrade J.-F., Biraud F., Aubry D., Darchy B., Drouhin J.-P.

169

Stellar and tidal evolution of TZ Fornacis: a case of asynchronism

Claret A., Giménez A.

180

Polarimetric observations of Cygnus X-2 and ten nearby field stars

Koch-Miramond L., Naylor T.

390

Dynamic pulsation amplitudes for a rotationally split nonradial mode: the  $l = 1$  case

Buchler J.R., Goupil M.-J., Serre T.

405

Type II supernova test cases and breakout modelling with flux-vector splitting and adaptive gridding

Kelly D.R.C., Korevaar P.

418

Coronographic imaging of T Tauri: discovery of an optical jet in Burnham nebula

Robberto M., Clampin M., Liori S., Paresce F., Saccà V., Staude H.J.

431

A multiwavelength study of the classical nova V 4169 Sagittarii

Scott A.D., Duerbeck H.W., Evans A., Chen A.-L., de Martino D., Hjellming R., Krautter J., Laney D., Parker Q.A., Rawlings J.M.C., van Winckel H.

439

ROSAT/SPSC All-Sky Survey observations of the ultra-soft X-ray transient TrA X-1 (A 1524-62). Detection during a "mini-outburst" and upper limit in quiescence

Barret D., Motch C., Pietsch W., Voges W.

459

- The companion of HR 5999 in the near infrared  
*Stecklum B., Eckart A., Henning T., Löwe M.* 463
- $\gamma$  Cassiopeiae: evidence for a Be star/white dwarf X-ray binary?  
*Haberl F.* 685
- The formation of Be stars in close binary systems. The importance of kicks and angular-momentum loss  
*Portegies Zwart S.F.* 691
- Multiple far-supercritical solutions for an  $\alpha\Lambda$ -dynamo  
*Muhli P., Brandenburg A., Moss D., Tuominen I.* 700
- Dependence of flare activity on BY Draconis on the phase of the short-term periodic light variation  
*Mavridis L.N., Avgoloupis S.I., Seiradakis J.H., Varvoglis P.P.* 705
- Tidal circularization and the eccentricity of binaries containing giant stars  
*Verbunt F., Phinney E.S.* 709
- (RN) Newtonian stellar oscillations  
*Beyer H.R., Schmidt B.G.* 722
- H<sub>2</sub>O maser emission from semiregular variables  
*Szymczak M., Engels D.* 727
- Equation of state of dense matter and maximum rotation frequency of neutron stars  
*Haensel P., Salgado M., Bonazzola S.* 745
- Stellar atmospheres**
- On the effective temperatures, surface gravities, and optical region fluxes of the magnetic CP stars  
*Adelman S.J., Pyper D.M., Lopez-Garcia Z., Caliskan H.* 467
- The He I surface distribution of the CP2 star CU Virginis  
*Hiesberger F., Piskunov N., Bonsack W.K., Weiss W.W., Ryabchikova T.A., Kuschnig R.* 473
- EUV spectroscopy of cool stars. I. The corona of  $\alpha$  Centauri observed with EUVE  
*Mewe R., Kaastra J.S., Schrijver C.J., van den Oord G.H.J., Alkemade F.J.M.* 477
- The  $\beta$  Pictoris circumstellar disk. XVII. Physical and chemical parameters of the disk  
*Lagrange A.M., Vidal-Madjar A., Deleuil M., Emerich C., Beust H., Ferlet R.* 499
- Detection of an X-ray flare on the low-activity G8 III-type giant  $\beta$  Bootis  
*Hünsch M., Reimers D.* 509
- Radiative transfer in axisymmetric circumstellar dust shells  
*Lopez B., Mékarnia D., Lefèvre J.* 752
- Decoupled line driven outflow around B and Be stars  
*Porter J.M., Drew J.E.* 761
- Accuracy of the astrophysical absolute flux calibrations: visible and near-infrared  
*Méessier C.* 771
- Diffuse matter in space (including H II regions and planetary nebulae)**
- The structure of optical stellar jets: a phenomenological analysis  
*Bacciotti F., Chiuderi C., Oliva E.* 185
- Kinematics of the 10<sup>6</sup>K gas derived from coronal iron lines in the Cygnus Loop supernova remnant  
*Sauvageot J.L., Decourchelle A.* 201
- 1435 MHz continuum observations of Upper-Scorpius  
*Combi J.A., Testori J.C., Romero G.E., Colomb F.R.* 514
- Gas motions in and origin of the supergiant shell LMC 4  
*Domgörgen H., Bomans D.J., de Boer K.S.* 523
- Bistability and dust/gas chemical modelling in dark interstellar clouds  
*Shalabiea O.M., Greenberg J.M.* 779
- Predictions for JHK photometry of molecular shocks  
*Smith M.D.* 789
- Optical properties of coagulated particles  
*Stognienko R., Henning T., Ossenkopf V.* 797
- The infrared band strengths of H<sub>2</sub>O, CO and CO<sub>2</sub> in laboratory simulations of astrophysical ice mixtures  
*Gerakines P.A., Schutte W.A., Greenberg J.M., van Dishoeck E.F.* 810
- (RN) Galactic magnetic field strengths, from three different methods – a cautionary note  
*Vallée J.P.* 819
- Molecular mixing layers in stellar outflows  
*Taylor S.D., Raga A.C.* 823
- A simulation of an HH jet in a molecular environment  
*Raga A.C., Taylor S.D., Cabrit S., Biro S.* 833
- The Sun**
- Dynamics of the solar granulation. III. Fractional diffusion  
*Nesis A., Hammer R., Hanslmeier A., Staiger J., Westendorp Plaza C., Grabowski U.* 210
- On the determination of the solar iron abundance using Fe I lines  
*Blackwell D.E., Lynas-Gray A.E., Smith G.* 217
- On the determination of the solar iron abundance using Fe I lines. Comments on a paper by D.E. Blackwell et al. and presentation of new results for weak lines  
*Holweger H., Kock M., Bard A.* 233
- Photometry of sunspot pores from partial eclipse observations  
*Bonet J.A., Sobotka M., Vázquez M.* 241
- Turbulent coronal heating. II. Twisted flux tube  
*Inverarity G.W., Priest E.R.* 395
- MHD disturbances in a coronal potential arcade generated by localized perturbers  
*Čadež V.M., Ballester J.L.* 537
- Time evolution of MHD disturbances impulsively excited by a localized perturber in a potential coronal arcade  
*Čadež V.M., Ballester J.L.* 550
- A solar dynamo in the overshoot layer: cycle period and butterfly diagram  
*Rüdiger G., Brandenburg A.* 557
- Speckle masking imaging of the moustache phenomenon  
*Denker C., de Boer C.R., Volkmer R., Kneer F.* 567
- Beam fragmentation and type III bursts  
*Vlahos L., Raoult A.* 844
- The solar system**
- Modulation of interplanetary hydrogen density distribution during the solar cycle  
*Ruciński D., Bzowski M.* 248

**Celestial mechanics and astrometry**

Proposed terminology for a general classification of rotational swing motions of the celestial solid bodies

Bois E.

850

**Physical and chemical processes**

An attempt to empirically evaluate the gravitational deflection of light in the modified Newtonian dynamics

Qin B., Wu X.P., Zou Z.L.

264

Structural stability of axisymmetric dynamo models

Tavakol R., Tworkowski A.S., Brandenburg A., Moss D., Tuominen I.

269

A self-consistent treatment of linear acceleration emission

Rowe E.T.

275

**Abstracts of articles which have been published in A&A Supplement Series 110, No. 1**

The CCD photometry of the globular cluster Palomar 1

Borisova J., Spassova N.

861

Kinematical observations of pairs of galaxies

Davoust E., Considère S.

861

New proper motion determination of Luyten catalogue stars (LTT) south of declination  $-40^\circ$  and right ascension between 16 h and 24 h

Wroblewski H., Torres C.

861

Prediction of planetary occultations of compact extragalactic radio sources during 1995.0–2050.0

Fu Y.-N., Xia Y.-F.

861

The archetype line-profile variable  $\epsilon$  45 Persei is a spectroscopic triple system

Tarasov A.E., Harmanec P., Horn J., Lyubimkov L.S., Rostopchin S.I., Koubský P., Blake C., Kostunin V.V., Walker G.A.H., Yang S.

862

New detections of  $5_1-6_0$  A<sup>+</sup>-methanol masers towards IRAS sources

van der Walt D.J., Gaylard M.J., MacLeod G.C.

862

On the spectral characteristics and atmospheric models of two types of white-light flares

Fang C., Ding M.D.

862

Observations of lunar occultations at Observatoire de la Côte d'Azur

Meyer C., Rabbia Y., Fräschlé M., Helmer G., Amieux G.

863

Lightcurves, magnitude-phase dependence and spin vector of asteroid 675 Ludmilla

Velichko F.P., Michalowski T., Erikson A., Krugly Y.N., Dahlgren M., Kalashnikov A.V., Lagerkvist C.-I.

863

Gaseous and stellar components in mixed pairs of galaxies. I. The data

Rampazzo R., Reduzzi L., Sulentic J.W., Madejsky R.

863

Adiabatic black hole cusp models

Cipollina M.

863

The ESO-Sculptor faint galaxy redshift survey: the spectroscopic sample

Bellanger C., de Lapparent V., Arnouts S., Mathez G., Mazure A., Mellier Y.

864

Contribution to the study of composite spectra. VII. HD 16646 (*Text in French*)

Carquillat J.M., Griffin R.F., Ginestet N.

864

Radial velocities. VII. Ground based measurements for Hipparcos (*Text in French*)

Duflo M., Fehrenbach C., Mannone C., Burnage R., Genty V.

864

Atomic data from the IRON Project. IX. Electron excitation of the  $^2P_{3/2}^o - ^2P_{1/2}^o$  fine-structure transition in chlorine-like ions, from ArII to NiXII

Pelan J., Berrington K.A.

864

